Matrix KVM over IP

KV-900x

User's Guide

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1. Introduction

The new generation solution of Matrix KVM over IP allows multi-user access and control of many computers/servers.
The KV-900x system consists of Transmitter (KV-900T), Receiver (KV-900R) and a Receiver & User Manager (KV-900RM). The KV-900T connects with a PC or Server. The Receiver connects with a DVI/VGA display, PS2 keyboard, PS2 mouse and optional speaker. All available 100M, Giga or Fiber Ethernet LAN switching HUB/router can be used to connect the Transmitter and the Receiver. You don't need to have a dedicated line for the system. Just plug the KV-900x units into your existing Ethernet network.

1.1 Features

- Supports multi-user access and control of many computers/servers.
- Convenient PC/Server selection via Hotkeys and intuitive On Screen Display (OSD) menus.
- Supports OSD menu to manage all user accounts by passwords and 3-level access priority (Administrator, Power User, Normal User).
- Just simply attach the VGA/DVI and audio to the KV-900T transmitter, it starts to encode audio/visual to the Ethernet based IP packets.
- Just simply attach the KV-900R receiver to the monitor and speaker; it starts to decode the IP packets to the audio/visual signals.
- Support one Transmitter and multiple Receivers mode. There is no delay in between each receiver.
- Support multiple Transmitters and multiple Receivers mode for grouping broadcast if the switching HUB has the IGMP function.
- Built in the source selection button on the KV-900R receiver

for selecting KV-900T transmitters.

- Support keyboard/mouse in the KV-900R receiver to remote control the transmitter PC for KVM control.
- Support IR bridge function, you can use the IR remote controller at KV-900R site to control the set-top box at the KV-900T site.
- Support HD video and stereo audio.
- Pure hardware design, plug-and-play, no additional software installation is required.

2. Unpacking Checklist

After you unpack the package, make sure that the following devices and accessories are available.

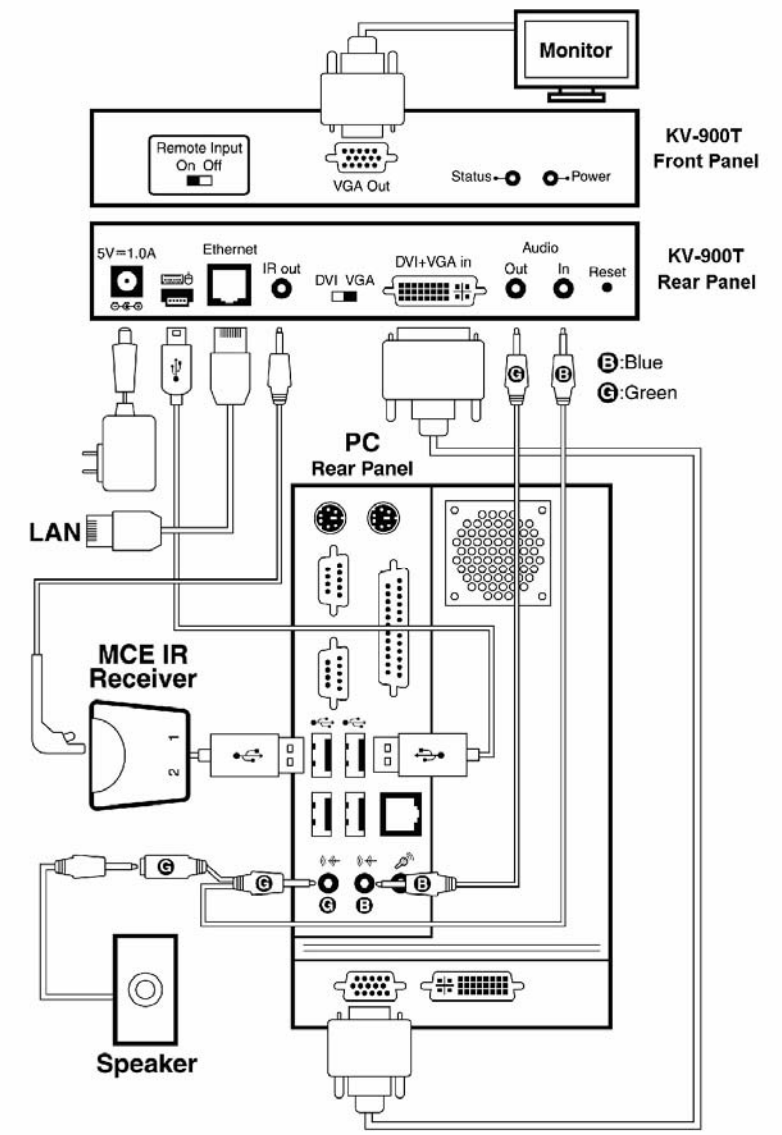
1. One KV-900T Transmitter (PC adaptor) to connect with PC. Cables for KV-900T are:
   - ✓ One VGA to DVI cable
   - ✓ Two audio cables
   - ✓ One USB cable
   - ✓ One IR blaster cable
2. One KV-900R Receiver (Display adaptor) to connect with display. Cables for KV-900R are:
   - ✓ One VGA to DVI cable
   - ✓ One Audio cable
3. Two power adapters
4. One user's guide

3. Connection Setup

This section describes how to connect the cables and how to connect the KV-900T and the KV-900R.

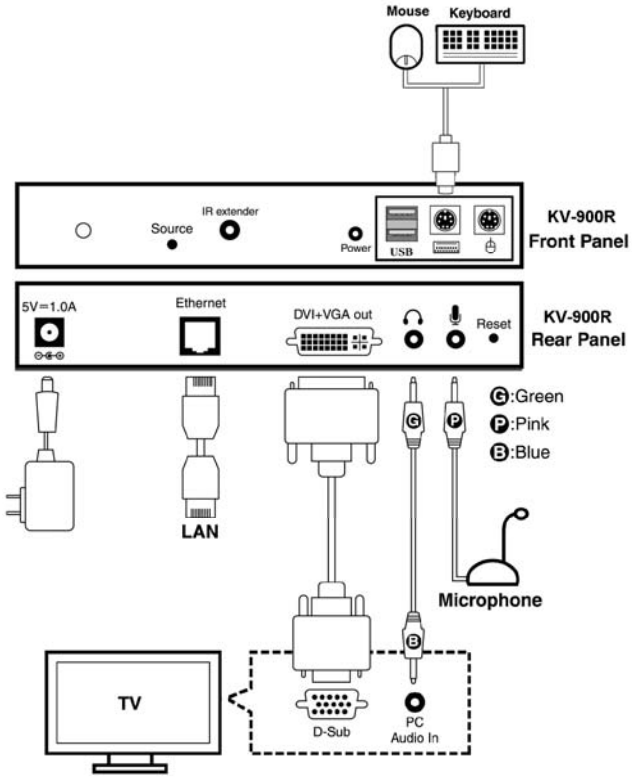
3. 1. KV-900T Transmitter (PC Adaptor) Connection

The KV-900T is connected to your PC. The connection method is shown below. Using the USB cable, VGA-to-DVI cable and two audio cables, connect rear panel connectors on the KV-900T to the connectors on PC. Your local monitor may be connected to the VGA connector on the front panel. The IR blaster cable is connected to the IR connector on rear panel and the IR blaster LED must be facing the IR receiver of your Media Center PC, TV tuner card or DVD player. Connect the included power adapter to the DC power socket and plug the power supply to wall. To avoid damage of the KV-900T, please use the power adapter in the package only. The RJ-45 connecter is for connection to any Ethernet CAT-5 device or directly to the KV-900R RJ-45 socket. A switching HUB can be placed between KV-900T and KV-900R but both KV-900T and KV-900R must be put in the same class C network.



3. 2. KV-900R Receiver (Display Adaptor) Connection

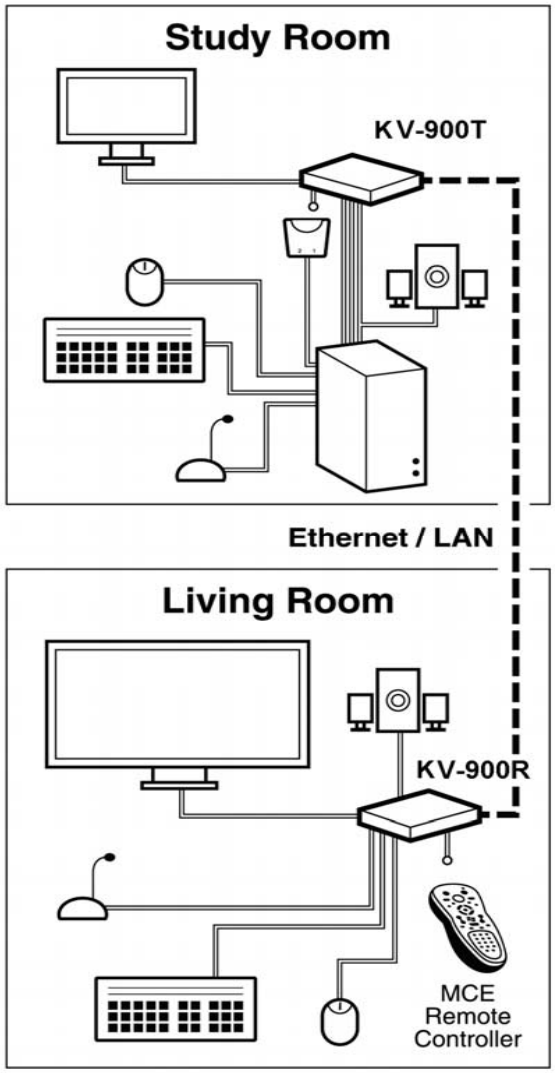
The DVI and audio out ports on the KV-900R are connected to the Display using the included VGA-to-DVI and audio cables. The other connectors are connected to peripherals such as a keyboard, mouse and microphone. There is an IR receiver connector at the rear panel of KV-900R. The IR receiver cable is connected to it and the receiver should be positioned to be visible from the front of the Display. A switching HUB or router can be placed between KV-900R and KV-900T but both of them must be put in the same class C network. Connect the included power adapter to the DC power socket and plug the power supply to wall. To avoid damage to the KV-900R, please use power adapter in the package. Turn on your Display and change the input source to D-sub, PC or VGA.



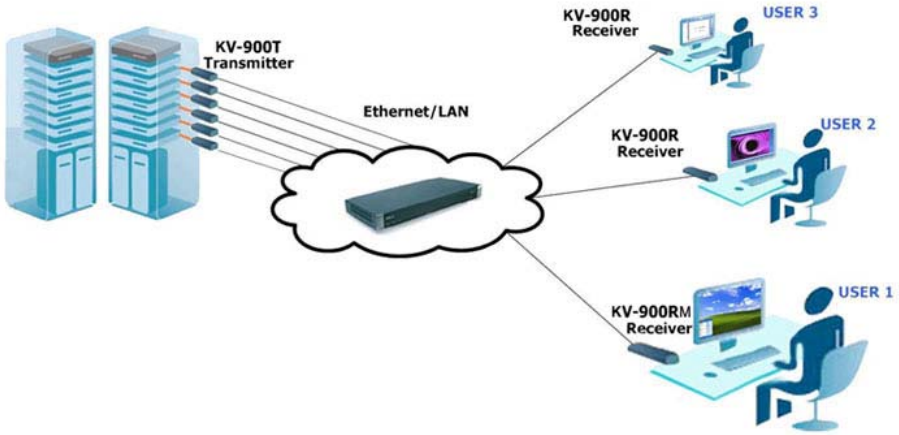
3. 3. System Connection Diagram

After the above connections are finished, the whole system should be shown as below.

Single installation:



Matrix installation:

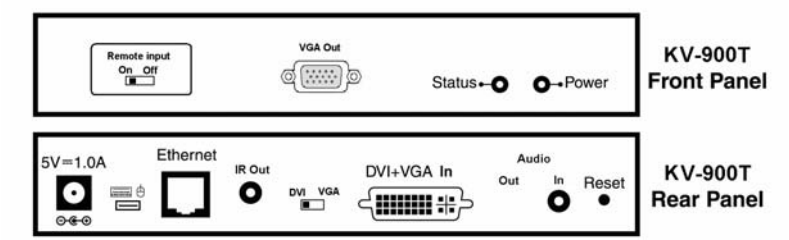


4. KV-900T Panel Description

The connectors on the rear panel of the KV-900T are connected to the source PC and the VGA connector on the front panel is connected to the local monitor. The power adapter, IR blaster cable and Ethernet cable are connected to the rear panel. There are two slide switches are located on the KV-900T. The [Remote input] switch selects whether the PC can be controlled by the keyboard, mouse or IR on the KV-900R receiver. The DVI/VGA switch can be used to select either DVI or VGA source input.

Note: The DVI connector on the rear panel of KV-900T is DVI-I (digital and analog) connector which supports DVI-D (digital), generally called DVI, or DVI-A (analog) which provides the same analog signal found on a VGA connector. The included cable is a VGA to DVI-A cable. If you want to use better performance DVI-D (digital) signal, you can use a DVI-D to DVI-D cable to connect your PC and the KV-900T.

4. 1. Front Panel and Rear Panel



Your local monitor can be connected to the VGA connector on the front panel of KV-900T. The Status and Power LEDs are located on that panel. There is a slide switch, named [Remote input], which selects the local or remote keyboard and mouse is controlled.

The rear panel has a DC in connector, mini USB connector for keyboard and mouse, RJ-45 connector for Ethernet cable, IR blaster connector, DVI-I connector and audio in and out connectors. The USB, monitor, audio in and out connect to your PC by using the cables provided in the package. The audio cable that is connected to “audio out” on the KV-900T must be connected to the line in (or sometimes mic) connector of your PC. The other audio cable is connected between “audio in” on the KV-900T and the line out connector of your PC. The RJ-45 connector is used for connection between KV-900T and KV-900R.

For more detailed information of cable connections, please refer to the “Connection Setup” section.

When the PC and the KV-900T are connected with VGA cable, the KV-900T can drive the local monitor and the remote monitor at the same time. In this configuration, the local monitor will also function if the KV-900T is power off. When the PC and the KV-900T are connected with DVI-D cable, the KV-900T will only drive the remote monitor and not the local monitor.

4. 2. LED display and Switches

LED	Color	Status	Descriptions
Status	Green	On	Local area network is connected
		Off	Local area network is not connected.
		Blink	Ethernet active
	Orange/Red	Blink	The KV-900T is using large network bandwidth.
Power	Off	Off	Power off
	Green	Green	Power on and network connection is established.
	Red	Red	Power on but network connection is not established.

Slide Switch	Descriptions
DVI VGA	[DVI]: The PC and the KV-900T are connected with DVI cable.
	[VGA]: The PC and the KV-900T are connected with VGA cable.
Remote input On Off	[On]: Remote KV-900R can use keyboard/mouse/IR to control the PC.
	[Off]: Remote KV-900R cannot use keyboard/mouse/IR to control the PC.

Push button	Descriptions
Reset	When the PC and the KV-900T are connected with VGA cable, sometimes the picture on the DISPLAY connected to KV-900R shifts from screen. This push button is used to reset the output picture. Press it to do auto adjustment.

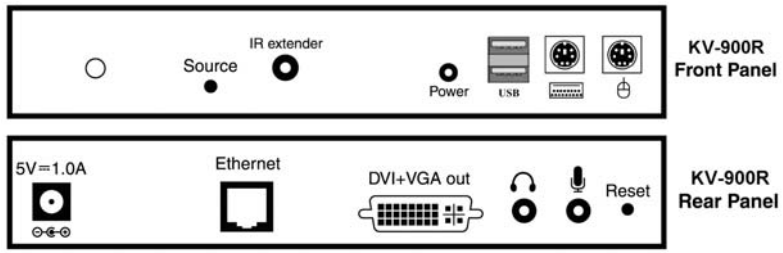
4. 3. IR Blaster

The IR blaster is connected to the IR blaster socket at the rear panel of the KV-900T. When you press any key on any infrared remote controller, the KV-900R receives the IR signal and transmits it to the KV-900T. The IR signal is delivered to the IR receiver through the LED on the IR blaster. To work properly, the IR blaster LED must be facing the IR receiver of your Windows Media Center Edition PC, TV tuner card or DVD player.

5. KV-900R Receiver (Display Adaptor)

The KV-900R is connected to your DISPLAY. It also has many connectors such as, power, RJ-45, keyboard, mouse, speaker, microphone and DVI, on the rear panel. There is a push button for source, two three-color LEDs and an IR receiver connector on the front panel.

5. 1. Front Panel and Rear Panel



On the front panel, there are two three-color LEDs that indicate Ethernet status and power. There is a push button to select the KV-900T that is used as the source when more than one KV-900T is on the network. The IR receiver cable is connected to IR receiver socket that receives IR signals form remote controllers.

On the rear panel, the DVI and speaker connectors are connected to DISPLAY using the included cables. The keyboard, mouse and microphone connectors are available for remote use of the PC. The KV-900R supports Ethernet connection or direct cable connection to KV-900T using CAT5 network cabling through the RJ-45 connector. To avoid damage to the KV-900R, please use the adapter in the package only.

5. 2. LED display

LED	Color	Status	Descriptions
RJ-45 Ethernet Port	Green (Right)	On	Local area network is connected
		Off	Local area network is not connected.
		Blink	Ethernet active
	Orange (Left)	Off	AV-901R is receiving data normally.
		On/Blink	AV-901R is with data receiving lost.
Power	Off	Off	Power off
	Green	Green	Power on and network connection is established.
	Red	Red	Power on but network connection is not established.

Push button	Descriptions
Source	Push it to select the KV-900T to be connected.

6. Selecting the PC Source

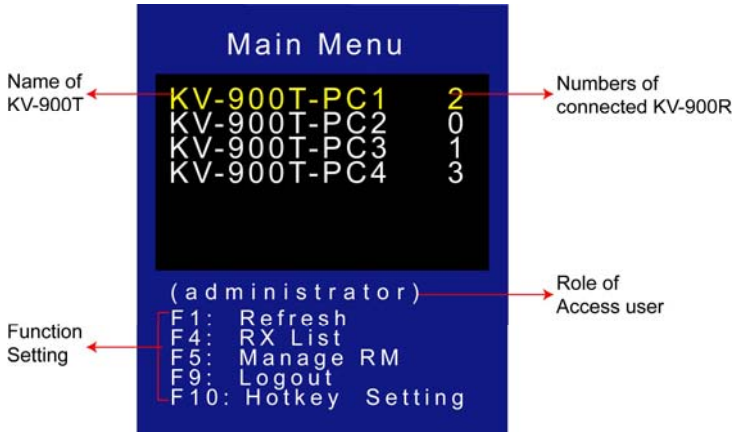
The system supports both panel button and keyboard hotkey with On Screen Display (OSD) menu on the KV-900R receiver to select any KV-900T transmitter source.

6.1 By OSD Select

The KV-900R OSD (On Screen Display) provides a visual, menu-driven interface that offers quick and convenient computer access and control, as well as efficient administration including user management (user name, access rights, passwords, etc.). The OSD menu can be activated by using Hot-keys.

6.1.1 Active the OSD Menu

To Active the OSD, press the <Ctrl> key twice within two seconds , you may see the OSD Main Menu screen showing a list of the computers, see the following picture. (The default OSD active-key is <Ctrl> , you may change to <Shift> or <Alt>, see Chapter 6.1.2 F10: Hotkey Setting)



Navigate to the desired computer with the →←↑↓ arrow keys, and press <Enter>. The selected computer's screen appears on the display, and uses the console keyboard and mouse to control the selected computer.

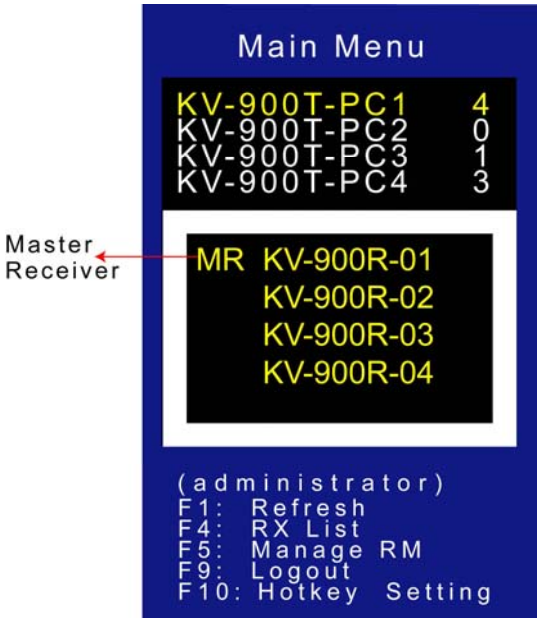
6.1.2 Function Setting

F1: Refresh

Press [F1] to update KV-900T Transmitters which are activated.

F4: RX List

Press [F4] to list all KV-900R receivers which are connected with the current KV-900T Transmitter. See the following picture for example:

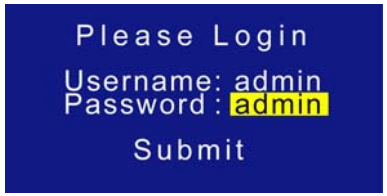


- KV-900T-PC1 Transmitter was connected by 4 x KV-900R Receivers (01~04).
- The marked "MR" means the KV-900R-01 is a Master Receiver.
- Only the Master Receiver KV-900R-01 allows to access and control the KV-900T-PC1 Transmitter. The other Receivers (KV-900R-02/03/04 are observing KV-900T-PC1's screen only.

F5: Manage RM

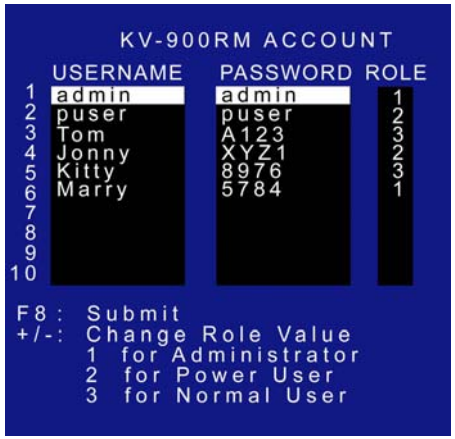
This function is used to set Usernames, Passwords and Access rights.

Press <F5> , an OSD menu appears as follows:



Please note only Administrator (Role Value 1) allows to manage the KV-900R Receiver to set usernames and passwords.

After you key in a name and password for the Administrator, a screen appears as follows:



To Edit a User account, please use the Navigation Keys to move the highlight bar, then Key in the new Name, password and modify or delete the old one. The maximum number of characters allowed for the username and password is 8. Legal characters include.

- All alpha characters: A~Z
- All numeric characters: 0—9
- +/-l:. to change role value 1~3.

Role Value = 1 : for Administrator, with highest access priority.
Role Value = 2 : for Power User, with middle access priority.
Role Value = 3 : for normal Administrator, with lowest access priority.

The user with higher access priority has the rights to take over lower priority users.

F10: Logout

To release a high priority of KVM access control, please press [F10]. For example, if you are an Administrator (Role Value 1) or a Power User (Role Value 2), then you can take over the control rights from others. So you like to release your access priority, please just press F10 to logout.

F10: Hotkey Setting

The default hotkey to activate the OSD menu is <CTRL>. Select any of the three hotkey options: <CTRL>, <SHIFT>, or <ALT> to change.

6.2 By Source button Select

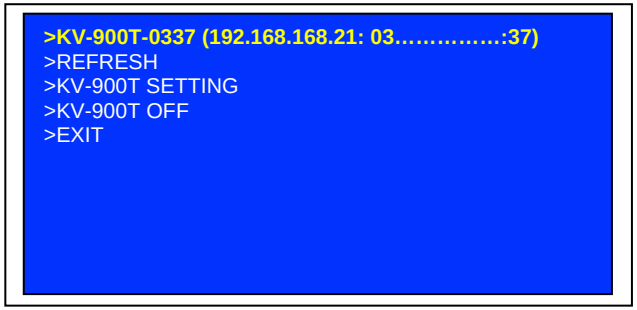
There is a push button called “source” on the KV-900R allows the proper KV-900T to be selected.

When the KV-900R Receiver is turned on, the KV-900R will automatically search the KV-900T transmitter on network and connect it.

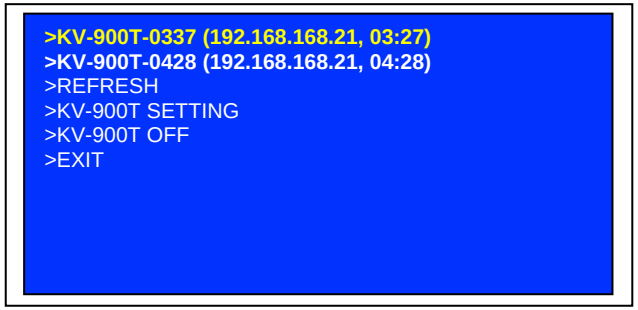
When the KV-900R is connected to KV-900T, the display will show that PC screen.

When the KV-900R does not find a KV-900T on network or Ethernet cable is not connected to the KV-900R, the display will show “No KV-900T”.

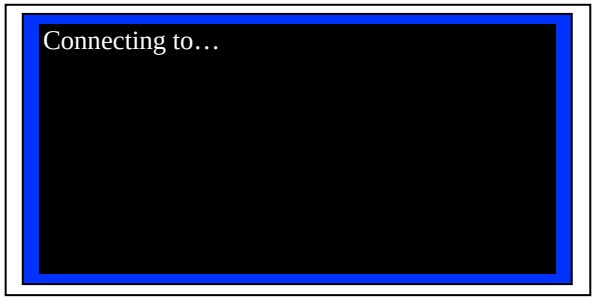
When the KV-900R finds one or more KV-900T in the network, it will show all the KV-900T on the DISPLAY.



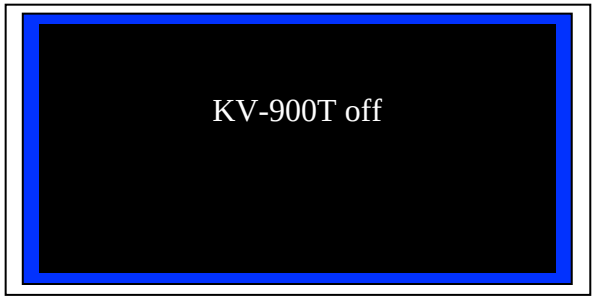
When there is more than one KV-900T on the network, the push button called “source” on the KV-900R allows the proper KV-900T to be selected.



When the source button is pushed and you select a KV-900T to be connected, the KV-900R will automatically connect to that KV-900T after three seconds. The display will show as below.



After the KV-900T and KV-900R connection is established, the KV-900R will display the PC screen that is connected to that KV-900T. When the KV-900T turns to sleep mode, The OSD will show as below:



7. Advanced Setup

This section is useful to upgrade firmware and to assign IP address for KV-900T and KV-900R.

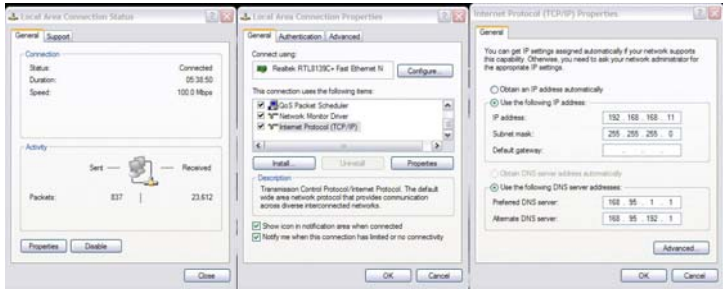
If you have many KV-900T devices installed, you should use this Advanced Setup to setup different IP for each KV-900T and KV-900R.

If you have only one KV-900T installed, you do not need to do this advanced setup.

7.1 Setup the KV-900T or the KV-900R

A HTTP server is embedded in each KV-900T and KV-900R. You can setup it via web browser. The default IP address of the **KV-900R** is **192.168.168.22** and the **KV-900T** is **192.168.168.21**. The default IP address will not be changed no matter what you assign the device IP address.

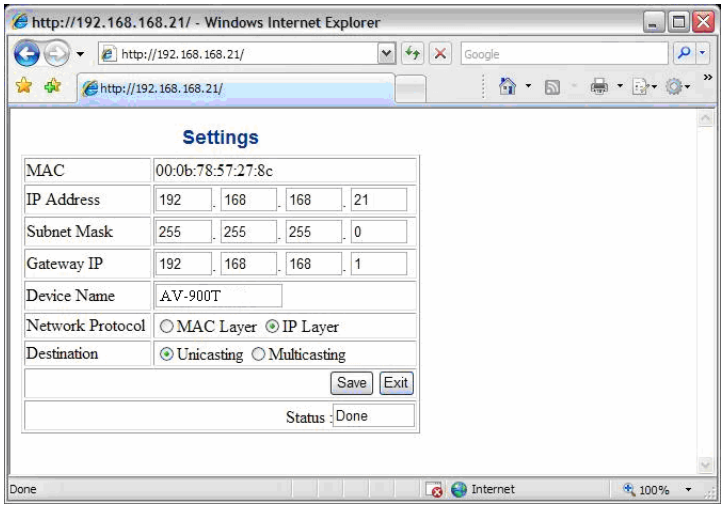
Step 1: Assign the PC or laptop IP address through Windows > Control Panel > Network Connections > Local Area Connections > Status > Properties > Internet Protocol (TCP/IP), Use the following IP address. Type the IP address field with 192.168.168.11 and Subnet mask with 255.255.255.0. After that press OK to save the configuration. (See the following picture)

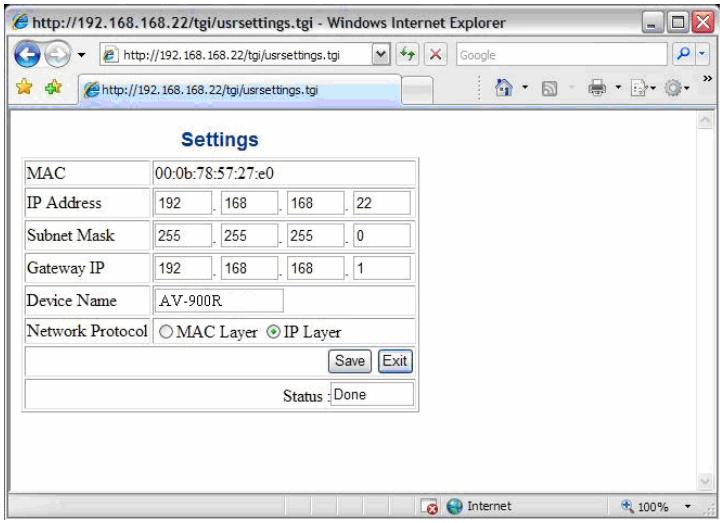


Step 2: Hold the **Reset** button of the device and power on. The power LED of the device will blink red. The power LED will become orange and the status LED in red. Only in this status, you can get access to the HTTP server of the device. On the other word, you cannot get access to the HTTP server in other status.

Step 3: Use an Ethernet Cable to connect the PC or laptop and the device. The power LED is still orange and the status LED becomes green blink.

Step 4: Ping the connected device through the sequence, Start, Run, cmd, ping 192.168.168.21 or ping 192.168.168.22. You will receive the reply if the connection is established. Use IE browser to get access the web server. You can setup IP address, subnet mask, gateway, device name, network protocol and destination in this page.





Device Name for the KV-900T is a name which will be shown via OSD.

Network protocol

For one-to-one application, one KV-900R connects to one KV-900T, you can use **MAC Layer**

For one-to-multi application, multi KV-900R connect to one KV-900T, you must use **IP Layer**

For multi-to-multi application, many KV-900R connect to multi KV-900T, you must use **IP Layer**

Destination can be chosen a way to transmit the audio and video packets.

For one-to-one application, one KV-900R connects to one KV-900T, you can use **Unicasting.**

For one-to-many application, many KV-900R connect to one KV-900T, you must use **Multicasting**.

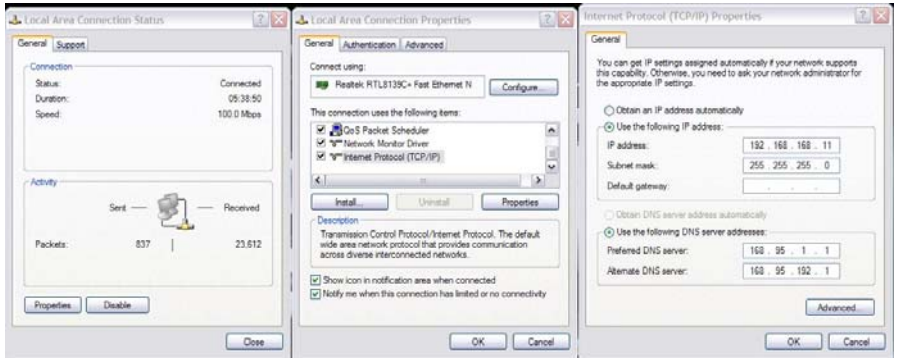
Step 5: After click Save button, the device shows Status LED yellow and Power LED blink red. Turn off the device.

7.2 Firmware Upgrade

To upgrade the KV-900T and KV-900R, you should save the new firmware into your PC or laptop first. A HTTP server is embedded in each KV-900T and KV-900R. You can upgrade firmware via web browser. The default IP address of the KV-900R is 192.168.168.22 and the KV-900T is 192.168.168.21. The default IP address will not be changed no matter what you configure the device IP address. You have to disable antivirus software and firewall software until the firmware upgrade process is accomplished.

Step 1: You should save the new firmware into your PC or laptop first.

Step 2: Assign the PC or laptop IP address through Control Panel > Network Connections > Local Area Connections > Status > Properties > Internet Protocol (TCP/IP), Use the following IP address. Type the IP address field with 192.168.168.11 and Subnet mask with 255.255.255.0. After that press OK to save the configuration.



Step 3: Hold the **Reset** button of the device to be upgraded firmware and power on. The power LED of the device will blink red. The power LED will become orange and the status red. Only in this status, you can get access to the HTTP server of the device. On the other word, you cannot get access to the HTTP server in other status.

Step 4: Use an Ethernet Cable to connect the PC or laptop and the device. The power LED is still orange and the status LED becomes green blink.

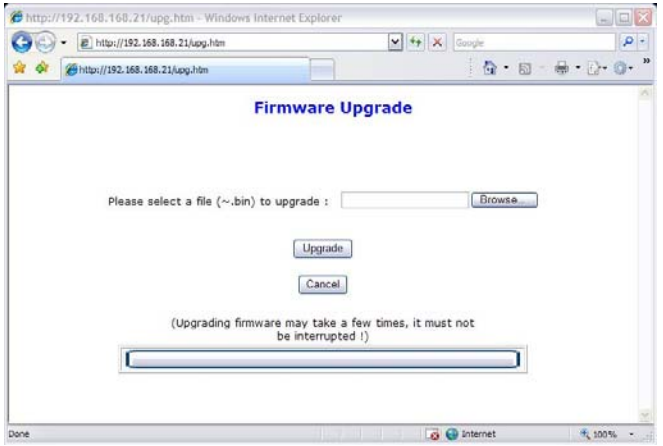
Step 5: Ping the connected device through the sequence, Start > Run > cmd > ping 192.168.168.21 or ping 192.168.168.22. You will receive the reply if the connection is established. Disable the antivirus and firewall software and use IE browser to get access the web server.

Type http://192.168.168.21/upg.htm to upgrade the KV-900T firmware.

Type http://192.168.168.22/upg.htm to upgrade the KV-900R firmware.

Note: You have to disable antivirus software and firewall software before you upgrade firmware. Firmware upgrade process cannot be interrupted so please do not turn off your computer or the upgraded device or disconnect the Ethernet cable until the process is finished. Otherwise the system will crush.

Step 6: Browse to the firmware file and click Upgrade. Upgrade process may take a few minutes. Please do not turn off your PC or the device or unplug the Ethernet cable. It will cause damage of the device. After firmware upgrade is accomplished, turn off the device.


Firmware Upgrade
Please select a file (~.bin) to upgrade :
Browse...
Upgrade
Cancel
(Upgrading firmware may take a few times, it must not be interrupted !)

8. Specifications

Input resolution
- All standard resolutions from 640 x 480 to 1920 x 1200 @ 70Hz ~ 60Hz
- 1440x900
- 1400 x1050
- 1680x1050
- 1360x768

Output resolution
- All standard resolutions from 640 x 480 to 1920 x 1080 @ 60Hz ~ 70Hz
- 1440x900
- 1400 x1050
- 1680x1050
- 1360x768

Output frame rate
- 640X480 @ 70fps 800X600 @ 70fps

- 1024X768 @ 60fps 1280X1024 @ 30fps
- 1600X1200 @ 30fps 720X480 @ 60fps
- 720X576 @ 50fps 1280X720 @ 30fps
- 1440x900 @ 30fps 1400 x1050 @ 30fps
- 1680x1050 @ 30fps 1360x768 @ 30fps
- 1920X1080 @ 25fps

Scalar
- Allows difference input and output resolution

LAN
- 10/100Mbps
- Auto-MDIX
- Flow control
- IR in/out
- 38KHz